

Claims

[c1] **WHAT IS CLAIMED IS:**

1. A device for automated manipulation of articles along a predetermined movement path, the device comprising: a working area having a working surface for articles; a manipulator arranged in the working area and comprising a gripping device for moving the articles; wherein the working surface is comprised of neighboring longitudinal elements, wherein longitudinal gaps are formed between the neighboring longitudinal elements; wherein the gripping device has at least one gripping finger configured to be lowered into the longitudinal gaps between the neighboring longitudinal elements and to move into a position underneath an article for picking up the article; wherein the article is essentially secured in the gripping device by a combination of acceleration forces generated along a movement path of the gripping device and of the force of gravity.

[c2] 2. The device according to claim 1, wherein the article is released from the at least one gripping finger by accelerations of the gripping device in the direction of the ac-

celeration due to gravity and is placed onto a predetermined target location by prompt retraction of the gripping device from the article.

- [c3] 3. The device according to claim 2, wherein the acceleration of the gripping device is greater than the acceleration due to gravity.
- [c4] 4. The device according to claim 1, wherein the gripping device is comprised exclusively of components arranged rigidly and immobile relative to one another.
- [c5] 5. The device according to claim 1, wherein the gripping device has a pivot axis extending approximately parallel to the working surface and is configured to tilt about the pivot axis.
- [c6] 6. The device according to claim 1, wherein the gripping device is U-shaped comprising a stay and a first and a second legs connected to ends of the stay, wherein the stay determines a receiving width of the gripping device for the article, wherein the first leg is formed by the gripping finger, wherein the second leg is a fastening leg configured to connect the gripping device to a manipulator arm, and wherein a connecting area where the fastening leg and the manipulator arm are connected is positioned above a center of gravity of the gripping device.

- [c7] 7. The device according to claim 1, wherein the gripping device has a lateral support flange for closing at least partially a lateral surface of the gripping device, wherein the support flange is preferably shorter than the at least one gripping finger.
- [c8] 8. The device according to claim 7, wherein the lateral support flange is positioned at least at one of a lateral spacing and a horizontal spacing relative to the at least one gripping finger neighboring the lateral support flange.
- [c9] 9. The device according to claim 1, wherein the working surface is comprised at least partially of a strap belt.
- [c10] 10. The device according to claim 1, wherein the working surface is a conveyor belt and the articles to be manipulated are transported on the conveyor belt into the working area of the gripping device.
- [c11] 11. The device according to claim 10, wherein the longitudinal elements are connected to the conveyor belt such that the longitudinal elements and the longitudinal gaps are aligned transversely to a transport direction of the conveyor belt, wherein the gripping device for picking up the article moves transversely to the transport direction of the conveyor belt into the position underneath the ar-

ticle.

- [c12] 12. The device according to claim 11, wherein the gripping device for picking up the article is moved at the same time in the transport direction of the conveyor belt.
- [c13] 13. The device according to claim 10, further comprising an intermediate support onto which the article is lifted.
- [c14] 14. The device according to claim 13, further comprising a lifting device for lifting the article, wherein the lifting device is arranged underneath the working surface and is configured to pass upwardly through the longitudinal gaps between the longitudinal elements forming the conveyor belt.
- [c15] 15. The device according to claim 13, wherein the intermediate support is positioned above the working surface.